ACUTE BRONCHITIS

A. GENERAL CONSIDERATIONS

Acute bronchitis is an acute self-limited inflammation of the tracheobronchial tree that usually develops as an acute URI, occasionally with secondary bacterial infection.

B. ESSENTIALS OF DIAGNOSIS

1. Cough that is initially nonproductive and dry.
2. Mild fever with chills.
3. Sore throat.
4. The cough may continue 2-3 weeks after other symptoms have subsided.
5. Substernal burning or tightness.
6. Scattered rhonchi and moist or crackling rales.
7. Wheezing noted after cough.

C. LABORATORY TESTS

1. WBC with differential.
2. Sputum Gram stain.

D. LABORATORY FINDINGS

1. WBC is normal to below normal; differential is normal.
2. Sputum Gram stain discloses mucus, WBC's, and normal flora.

E. COMPLICATIONS

1. Pneumonia

F. TREATMENT

1. Increase fluid intake to 3-4 liters per day.
2. Warm humidified air.
3. Expectorants
4. When wheezing is prominent or shortness of breath occurs, or give inhaler, or give Theophylline 250 mg PO every 6 hours.
5. Antibiotics are indicated when purulent sputum is present, when high fever persists, or the patient is more than mildly ill. Give Tetracycline 250mg PO QID X 10 days or Erythromycin 250 mg PO QID x 10 days.
6. Stop smoking.
7. Bedrest until fever subsides.
8. ASA prn fever.
9. You must differentiate this from pneumonia. If there is a fever of over 101^0 F, chest pain, productive cough & SOB, you are dealing with pneumonia. Contact a Medical Officer.

G. DISPOSITION

1. Reevaluate the patient at no more than 24 hour intervals.
2. If the symptoms persist for greater than 48 hours, contact a Medical Officer.
3. If the symptoms become worse, contact a Medical Officer.

ACUTE EPIGLOTTITIS

A. GENERAL CONSIDERATIONS

The peak incidence of this disease is in childhood between the ages 1-2 years old. Many studies, however, indicate that up to 12% of the cases occur in adults. The disease is most often caused by Haemophilus influenzae. Other causes include pneumococcus, streptococcus, and parainfluenza virus.

It is a rapidly developing inflammation/infection of the epiglottis and supraglottic structures. It almost invariably can or does result in acute airway obstruction.

B. ESSENTIALS OF DIAGNOSIS

1. Sore throat
2. Fever
3. Hoarseness
4. Dysphagia
5. Drooling
6. Tachypnea
7. Tachypnea
8. Inspiratory stridor
9. Inspiratory retractions

C. LABORATORY TESTS

1. None.

D. LABORATORY FINDINGS

1. None.

E. COMPLICATIONS

1. Airway obstruction, shock and death

F. TREATMENT

1. DO NOT make any attempt to visualize the epiglottis.
2. DO NOT try and intubate. This would most likely result in a worsening of the edema and further airway obstruction.
3. Give warm humidified oxygen.
4. Give Ampicillin 250mg IV q 6 hrs/Chloramphenicol 25mg IV Q 6hrs or Cefuroxine IV 1 gm Q 6 hr.
5. Be prepared for a cricothyroidotomy at a moments notice. Remember that a needle cricothyroidotomy only provides an adequate airway for 30-45 minutes (then CO_2 retention becomes a factor). A surgical airway is needed. See the section on cricothyroidotomy.

G. DISPOSITION

1. Contact a Medical Officer immediately.
2. DO NOT over stimulate the patient.
3. Prepare for a MEDEVAC. There must be a capability for emergency cricothyroidotomy en route.

ASPIRATION PNEUMONIA

A. GENERAL CONSIDERATIONS

Aspiration in this context refers to the inhalation of foreign materials into the respiratory tree. Minor amounts of benign material can be aspirated without sequela. The outcome is dependent on the type/amount of material aspirated.

Aspiration pneumonia may follow anesthesia, alcohol intoxication, seizure disorders, esophageal disorders, water immersion or any disturbance of the level of consciousness with vomiting. If the gastric contents are strongly acidic, it may cause a chemical pneumonitis.

To generalize aspiration pneumonia, it is typically seen in three settings;

1. Obtunded patient where gag reflex and cough are ineffective.
2. Impaired cardiopulmonary status with compromised clearing mechanisms.
3. Patients who require pulmonary instrumentation.

NOTE: In the operational setting, you will not see the type of patient in #3. What you will see are patients from near drownings, severe alcohol intoxications, seizure disorders etc.. The onset of symptoms may be delayed from the time of aspiration. DO NOT be fooled with someone who appears fine shortly after the insult.

B. ESSENTIALS OF DIAGNOSIS

1. Pulmonary edema: (occurs usually within 24 hours)

   a. Extreme dyspnea, cyanosis, tachypnea, or hyperpnea.
   b. Restlessness and anxiety with a sense of suffocation.
   c. Pallor and diaphoresis.
   d. Thready pulse.
   e. Blood pressure may be difficult to obtain.

2. Bronchospasm:

   a. Wheezing
   b. Rales
   c. Coughing
   d. Shortness of breath.

3. Signs of bacterial pneumonia. See the section of this manual that deal with this topic. (The appearance of pneumonia is often delayed several days)

C. LABORATORY TESTS

1. WBC with differential shows leukocytosis.
2. Sputum smear.

D. LABORATORY FINDINGS

1. WBC with differential shows leukocytosis.
2. Sputum smear demonstrates pus cells and bacteria.

E. COMPLICATIONS

1. Chemical pneumonitis
2. Acidosis
3. Pulmonary edema
4. Death

F. TREATMENT

1. The patient may NOT show signs & symptoms for a period of up to 24 hours from the insult. With any significant aspiration, close observation for 24 hours is mandatory.

2. For patients with pulmonary edema or bronchospasm:

a. Give oxygen therapy.

NOTE: THE VALUE OF STEROIDS IS NOT PROVEN, AND THEIR USE MAY INCREASE THE RISK OF SUPERINFECTION.

3. Antimicrobial therapy should be based on the presence of fever, leukocytosis, pus, and bacteria in the sputum.

   a. Penicillin G
   b. Ceftriaxone 1 gram q 12 hours.
   c. Gentamicin if Gram-negative forms predominate (80mg IV q 8 hours).

4. Aminophylline injection (5mg/kg for the patient not already on Theophylline and 2.5mg/kg for the patient who is currently on Theophylline. Mix in 5% dextrose and run at 25mg/min).
5. Provide chest physical therapy.
6. Stop smoking.

G. DISPOSITION

1. Consult Medical Officer for further treatment and disposition.

ASTHMA

A. GENERAL CONSIDERATIONS

Asthma is a respiratory disorder characterized by obstruction of airflow from tracheobronchial narrowing caused by bronchospasm, increased mucus secretions and edema of the bronchial wall. It usually occurs in response to allergies, infections, exercise, cold air, inhalation of irritants, or emotional upset.

B. ESSENTIALS OF DIAGNOSIS

1. Manifested by paroxysms of dyspnea, wheezing and cough.
2. Acute exacerbations with symptom free periods
3. The use of accessory muscles of respiration and the presence of a paradoxical pulse indicate a severe attack.
4. Sensation of tightness in the chest.
5. Tachypnea, may see tachycardia.
6. Prolonged expiration.
7. Wheezing in both inspiration and expiration is common.
8. Remember that as the obstruction gets worse, the wheezing may disappear. Therefore, the entire picture must be evaluated and NOT just the presence of wheezing.

C. LABORATORY TESTS

1. None.

D. LABORATORY FINDINGS

1. None.

E. COMPLICATIONS

1. Status Asthmaticus.
2. Bronchopneumonia
3. Death from respiratory exhaustion.

F. TREATMENT

1. Give Epinephrine 1:1,000 0.3 ml subcutaneously which may be repeated in 20-30 minutes. If the condition does not improve after the second dose of Epinephrine, give Aminophylline IV and consult with the Medical Officer.
2. Oral or IV hydration
3. Give humidified oxygen at 4-6 liters/minute with a nasal catheter or by face mask.
4. Give Aminophylline if Epinephrine fails to control wheezing.

    a. Loading dose is "5" mg/kg of body weight given by IV push over 10 minutes (unless patient is already on maintenance oral Theophylline, then give 2.5mg/kg).
    b. Then provide maintenance with IV infusion delivering 0.5mg/kg per hour.

5. As directed by the Medical Officer, steroids may be required if Aminophylline does not control wheezing after 12 hours.
6. Give oral Theophylline after wheezing is controlled (200-300mg PO tid).
7. Albuterol aerosol inhaler may be substituted for Epinephrine at a dose of 2 inhalations every 4-6 hours for mild attacks or more frequently up to 1 or 2 inhalations every 15 to 30 minutes to break a severe attack.
8. Stop smoking.

G. DISPOSITION

1. If there is a poor response to treatment or wheezing increases, contact an Medical Officer ASAP. If there has been good response to treatment but wheezing still persists after 24 hours contact a Medical Officer.

BACTERIAL OR VIRAL PNEUMONIA

A. GENERAL CONSIDERATIONS

Pneumonia is an acute inflammatory process in lung parenchyma caused by bacteria, viruses, or mycoplasmal organisms. It is commonly secondary to viral respiratory diseases, aspiration, malnutrition, exposure to cold or noxious gases, alcohol intoxication, depression of cerebral functions by drugs, and cardiac failure.

The most frequent symptoms are **fever, productive cough, dyspnea, and chest pain.**

Generally speaking, **viral pneumonias** are not common in otherwise healthy adults. They are usually more gradual in onset. The most common type of viral pneumonia is influenza. This occurs primarily in patients who have underlying cardiac or pulmonary disease. Other causes include: measles, varicella, and adenovirus. Treat them with Erythromycin (possible secondary infection) and use the ancillary measures as with bacterial pneumonias (below).

The following deals with bacterial pneumonia.

B. ESSENTIALS OF DIAGNOSIS

1. The onset of symptoms is generally abrupt.
2. Fever and chills are common.
3. Cough productive of purulent or bloody sputum. In some patients cough may be minimal or non-productive.
4. Dyspnea is common.
5. Stabbing chest pain with respiration (occasionally referred to the shoulder, flank or abdomen).
6. Asculatory findings: may sound normal even with a large infiltrate. Generally you hear rales, bronchial breath sounds, early end-inspiratory crackles, etc..
7. Generally find consolidation frequent with bacterial, rare with viral, may see dullness to percussion, increased tactile fremitus, egophony, whispered pectoriloquy, etc..
8. You may see decreased chest excursion on the affected side.
9. Cyanosis may be present.
10. Tachypnea and tachycardia (in response to fever) are common.

C. LABORATORY TESTS

1. CBC with differential.
2. Sputum gram stain.

D. LABORATORY FINDINGS

1. CBC with differential:

   a. WBC elevated (>10,000) with or without a left shift in bacterial pneumonia.
   b. WBC normal/elevated or decreased in viral pneumonia.

2. Sputum:

   a. Bacterial pneumonia - abundant neutrophils and one predominant bacterial organism.
   b. Viral pneumonia - few neutrophils and normal respiratory (mixed) flora (upper airway).
   c. Numerous epithelial cells indicates sample is contaminated with too much saliva for an accurate gram stain,

E. COMPLICATIONS

1. Bacteremia and sepsis.
2. Pulmonary abscess.
3. Meningitis.
4. Empyema.
5. Pulmonary edema.
6. Heart failure.

F. TREATMENT

1. Give antibiotics for 10 days. The choice is based on the morphology of the organism. For pneumonia with consolidation and rusty/blood streaked sputum.

   a. Procaine Penicillin G 600,000 units IM tid. After improvement, you can switch to Penicillin VK 250mg PO qid x 10 days. For those patients who are significantly ill, give penicillin G 1 million units IV q 4 hours.
   b. Erythromycin 500mg PO qid x 10 days may be used in the patient allergic to penicillin, in the patient with nonbacterial pneumonia, or with the patient in which the causative agent is unknown.

2. IV therapy for hydration - match urinary and gastric (remember that an NG tube may be necessary because of a paralytic ileus) output plus 750cc/day.
3. Give oxygen at 3-6 liters/minute. Humidify.
4. Liquid diet initially.
5. Expectorants, analgesics.
6. Bed rest.
7. Chest physical therapy.
8. No smoking.

G. DISPOSITION

1. Most of the patients will be MEDEVACED. Consult with a Medical Officer on a case-by case basis.

CHRONIC OBSTRUCTIVE PULMONARY DISEASE (COPD)

A. GENERAL CONSIDERATIONS

Obstructive diseases of the lungs are very common in the United States. A variety of diseases cause airways obstruction. The distinction between the various types is confusing. All are characterized by their resultant irreversible generalized airways obstruction. The primary cause is smoking, but it may be caused by other pollutants or respiratory irritants.

We are talking of diseases such as chronic bronchitis with obstruction, asthma, asthmatic bronchitis and emphysema etc. History is of paramount importance. Which occurred first, the cough or the wheezing? A history of smoking or other toxic irritants? Duration of symptoms? Severity of symptoms? New symptoms? With the limited facilities available shipboard, the history becomes even more important.

The stage of the illness plays an important role. Severe dyspnea occurs late in the disease. It is unlikely that you will encounter a patient with significant disease (other than a humanitarian act on the high sea's). The patients you will encounter will have less significant emphysema or an acute exacerbation of asthma or chronic bronchitis.

When we talk of obstruction, we mean the increased resistance to airflow during forced expiration. That is, they can breath in but have trouble breathing out. There are other diseases that are restrictive in nature. In reality, most of the diseases have both components (obstructive and restrictive parts). To make it easier to evaluate & treat these patients shipboard, we will discuss them as if they do not coexist.

Generally, COPD is broken down into two categories:

- predominant emphysema
- predominant bronchitis

B. ESSENTIALS OF DIAGNOSIS

	PREDOMINANT EMPHYSEMA	PREDOMINANT BRONCHITIS
Age at diagnosis	+/- 60	+/- 50
Dyspnea	Severe	Mild
Cough	After dyspnea starts	Before dyspnea starts
Sputum	Scanty, mucoid	Copious, purulent
Bronchial infections	Less frequent	More frequent
Resonance to percussion	Hyperresonant	Normal
Expiratory phase	Prolonged	
Hematocrit	35-45%	45-55%
Common name	pink puffer	blue bloater

C. LABORATORY TESTS

1. WBC
2. Sputum gram stain

D. LABORATORY FINDINGS

1. To R/O infection.
2. To R/O infection.

E. COMPLICATIONS

1. Atelectasis
2. Pneumonia
3. Right heart failure
4. Death

F. TREATMENT

1. Stop smoking.
2. Avoid air pollutants and irritants.
3. Bronchodilators via nebulizer if in acute distress:

    a. Inhaled Albuterol or Metaproterenol by nebulizer or metered dose inhaler every 4 hours (see asthma section).
    b. Theophylline tablets (Quibron plus) 300mg 2-3 times a day.
    c. Use Aminophylline by intravenous injection for acute severe dyspnea with wheezing in COPD patients as you would for an acute asthma attack.

4. Antibiotics are reserved for acute exacerbations of infection.

    a. Ampicillin 250-500 mg PO QID x 10 days.
    b. Erythromycin 500 mg PO QID x 10 days.

5. Give oxygen at 1-2 liters/minute via nasal catheter.
6. Provide chest physical therapy and postural drainage.

NOTE: OVER-OXYGENATION MAY CAUSE RESPIRATORY ARREST!

G. DISPOSITION

1. Monitor temperature.
2. Consult Medical Officer in cases of acute exacerbation.
3. MEDEVAC if recommended by Medical Officer.

HYPERVENTILATION SYNDROME

A. GENERAL CONSIDERATIONS

Hyperventilation is the usual response of the respiratory system to a variety of direct and indirect insults and is generally considered normal when associated with a pathologic cause (heart failure, asthma, pneumonia, fever, shock, etc.). In anxiety states, hyperventilation may occur inappropriately, leading to a reduced carbon dioxide level in the blood and various symptoms.

B. ESSENTIALS OF DIAGNOSIS

1. Increased respiratory rate - non-specific and sometimes not obvious.
2. Anxiety and apprehension.
3. Dyspnea - Typically more so at rest, associated with irregular signing respirations, and not as noticeable with exertion.
4. Vague chest discomfort, fleeting sharp chest pains.
5. Palpitations, light headedness.
6. Syncope/fainting possible due to cerebral vasospasm from the low CO2. (N.B. Exertional syncope is always pathologic)
7. Numbness, tingling around lips and in hands and feet, occasionally with muscle spasms.

C. LABORATORY TESTS

1. None.

D. LABORATORY FINDINGS

1. None.

E. COMPLICATIONS

1. Self Injury from fainting.
2. Hypoxia

F. TREATMENT

1. Reassurance
2. Rebreathing into a paper bag.
3. Give Diazepam 5 mg PO for severe anxiety states if you are certain there is no underlying pathologic condition.

G. DISPOSITION

1. If due to underlying disease, treat as capability allows and confer with Medical Officer for treatment or MEDEVAC.
2. If chronic or recurrent due to anxiety, treat symptomatically.
3. If anxiety is chronic or recurrent, refer to psychiatric clinic.

LARYNGEAL CARCINOMA

A. GENERAL CONSIDERATIONS

Benign and malignant laryngeal tumors produce similar symptoms. The symptoms depend on the size and location of the tumor. Malignant laryngeal tumors arise from squamous cells.

B. ESSENTIALS OF DIAGNOSIS

1. Persistent hoarseness is the chief complaint.
2. As the tumor enlarges, stridor and dyspnea occur.
3. Laryngeal examination reveals a mass or ulceration at the tumor site.
4. Submucosal tumors present only as a fullness or swelling of the affected area.

C. LABORATORY TESTS

1. None.

D. LABORATORY FINDINGS

1. None.

E. COMPLICATIONS

1. Airway obstruction.
2. Death

F. TREATMENT

1. Treat symptomatically, as in laryngitis.
2. Cricothyroidotomy may be necessary if respiratory obstruction occurs.

G. DISPOSITION

1. Any time laryngeal symptoms persist 2-3 weeks or more, seek a Medical Officer's advice.
2. At the first indication of a mass, contact a Medical Officer ASAP.

LARYNGITIS

A. GENERAL CONSIDERATIONS

This is an acute inflammation/infection of the larynx. The cause can vary with viral, bacterial, allergic, excessive use of the voice and inhaled irritants all being possible etiologies.

B. ESSENTIALS OF DIAGNOSIS

1. Hoarseness is the chief complaint.
2. Other signs and symptoms vary with the severity of the infection.
3. Throat pain, with constant urge to clear throat.
4. Pharyngeal and laryngeal mucosa are inflamed on indirect laryngoscopy.
5. Larynx may appear edematous, with or without exudate.

C. LABORATORY TESTS

1. None.

D. LABORATORY FINDINGS

1. None.

G. COMPLICATIONS

1. Hemoptysis
2. Stridor and dyspnea caused by the laryngeal edema.
3. Respiratory distress secondary to obstruction (#1 above).

F. TREATMENT

1. Absolute voice rest for 3-5 days.
2. Warm humidified air.
3. Stop smoking.
4. Force warm fluids.
5. Anesthetics throat lozenges.
6. If underlying cause is bacterial, treat with appropriate antibiotics.
7. Be prepared for cricothyroidotomy if signs and symptoms of respiratory embarrassment occur (rare, but possible). See complications above.

G. DISPOSITION

1. If dyspnea is present, seek a Medical Officer's advice ASAP and prepare to MEDEVAC THE PATIENT.
2. If no improvement in 3-5 days, contact a Medical Officer.
3. If the condition worsens, contact a Medical Officer.

MYCOPLASMA PNEUMONIA

A. GENERAL CONSIDERATIONS

The Mycoplasma pneumonia organism is spread by respiratory secretions and most often causes disease in children and young adults. The organism occurs endemically within the family, but it is also the cause of endemic pneumonia in military or school populations. It is difficult to distinguish between viral and mycoplasma pneumonias. They are commonly called "walking pneumonia" or "Atypical pneumonia".

B. ESSENTIALS OF DIAGNOSIS

1. Gradual onset.
2. Lassitude
3. Sore throat and increasingly severe cough, which may be accompanied by chest pains secondary to the coughing paroxyxms.
4. Headache, a major symptom.
5. Myalgia
6. Intermittent low fever, usually less than 102.
7. Scanty and sometimes blood flecked sputum.
8. Minimal rales and consolidation.
9. Pleuritic chest pain, hemoptysis and chills are uncommon.

C. LABORATORY TESTS

1. WBC with differential.
2. Sputum Gram stain.

D. LABORATORY FINDINGS

1. WBC with differential is usually within normal limits.
2. The gram stain shows leukocytes or neutrophils and normal flora.

E. COMPLICATIONS

1. Same as with bacterial and viral pneumonia.

F. TREATMENT

1. Give Erythromycin 500mg PO QID for 14 days.
2. Give Tetracycline 500mg PO qid x 10 days for the patient who is allergic to Erythromycin.
3. For symptomatic relief follow the same regimen as for bacterial and viral infections.

G. DISPOSITION

1. Strict clinical observation for signs of complications.
2. Consult with a Medical Officer
3. Consult Medical Officer if patient deteriorates or continues to have documented fevers for more than 5 days.

PULMONARY EDEMA

A. GENERAL CONSIDERATIONS

Pulmonary edema is an excessive accumulation of fluid in the lung tissues and air spaces (alveoli and airways). This fluid contains both macromolecules and red blood cells. The causes can be basically broken down into two categories:

1. Cardiogenic - The changes have a hemodynamic origin. There is an increase in pulmonary capillary pressure. Ex: CHF, arrhythmias, MI.

2. Noncardiogenic - The changes are alterations in the permeability of alveolar and capillary membranes.

The specific causes you may expect to see in the operational environment include:

1. Congestive heart failure (CHF) - THE MOST COMMON CAUSE.
2. Chest trauma.
3. Pulmonary embolism.
4. Barotrauma - Both from altitude and submersion.
5. Poisoning - From drugs and inhaled toxins.
6. Fluid overload
7. Interstitial pneumonia - esp varicella.

B. ESSENTIALS OF DIAGNOSIS

1. Apprehension - sometimes evident up to several hours before other symptoms develop.
2. Choking sensation.
3. Cough - with frothy and sometimes bloody sputum (remember that the fluid often contains RBC's).
4. Dyspnea, orthopnea
5. Cyanosis
6. Audible rales & rhonchi
7. Pallor & diaphoresis
8. Tachypnea
9. May have tachycardia either as a cause (arrhythmia) or as a result of the edema.

C. LABORATORY TESTS

1. None.

D. LABORATORY FINDINGS

1. None.

E. COMPLICATIONS

1. This is really dependent on the cause and extent of the pulmonary edema. However, it includes:

   a. Adult respiratory distress syndrome (ARDS)
   b. Respiratory insufficiency
   c. Hypoxia with resultant organ damage
   d. Death

F. TREATMENT

1. Confer with Medical Officer if diagnosis is suspected.
2. Bed rest with head elevated.
3. Give oxygen, at 6-10 liters/minute.
4. If patient can not breath adequately, perform assist bagging (or complete airway management if there is no spontaneous respiratory activity).

5. Diuretics - Give two thiazide diuretic (50mg/tablet) PO immediately.
6. To maintain cardiac output provide fluid intake at 20-25 ml/kg of body weight daily (if you have to keep the patient for greater than 24 hours, otherwise run at KVO).
7. Treat any underlying infections.
8. Morphine - 1-3mg IV every 2hrs. Watch for respiratory depression with this.
9. Rotating tourniquets - if the above measures do not produce much improvement. Place tourniquets on two limbs at the same time. Rotate in 10-15 minutes.
10. Nitroglycerin - if the edema is from a cardiogenic cause and the blood pressure is stable. May be given SL.
11. Aminophylline - one MAY consider the use of this to help treat the bronchospasm and to augment cardiac output. DO NOT use if the pulse is irregular. This in itself can cause arrhythmias. Contact a Medical Officer prior to using this medication.

G. DISPOSITION

1. MEDEVAC ASAP

PULMONARY TUBERCULOSIS

A. GENERAL CONSIDERATIONS

Tuberculosis is caused by an acid-fast bacillus that is carried in airborne droplets produced by the cough of a person with active tuberculosis. It is a necrotizing bacterial (mycobacterial) infection most commonly involving the lungs. The infection may cause disease shortly after inoculation or months to years later.

B. ESSENTIALS OF DIAGNOSIS

1. Symptoms may be absent or mild and nonspecific.
2. Cough produces a odorless green or yellow sputum that may contain blood.
3. Malaise and weight loss, anorexia, and low-grade fever.
4. Wheezing, bronchial breath sounds, inspiratory crackles, apical dullness may be present.
5. Typically little or no physical findings early in the disease.
6. Night sweats
7. Fatigue
8. Headaches, especially in the evening.
9. Palpitations during mild exertion.
10. Some patients develop a productive cough, fever and pleuritic chest pain suggestive of bacterial pneumonia.

C. LABORATORY TESTS

1. PPD skin tests.

D. LABORATORY FINDINGS

1. A reaction of 10mm or more is positive.

E. COMPLICATIONS

1. Dissemination of the disease by aspiration of infected sputum,local extension of lesions, and lymphogenous or hematogenous spread.
2. Tuberculous pleurisy may be evident at onset of active disease in young adults.
3. Massive dissemination (Miliary TB).
4. Significant hemoptysis.
5. It is contagious.

F. TREATMENT

1. Isolation (specifically respiratory isolation).
2. Stop smoking.

G. DISPOSITION

1. MEDEVAC.
2. Refer converters and reactors to Medical Officer ASAP for INH therapy.
3. If at sea, transmit DAR, if in port contact nearest NEPMU.

SMOKE INHALATION

A. GENERAL CONSIDERATIONS

Lung tissue may be damaged by inhalation of fire by-products. One of the major concerns is pulmonary edema.

B. ESSENTIALS OF DIAGNOSIS

1. Hyperemia of nasal and pharyngeal mucosa.
2. Cough.
3. Dyspnea.
4. Hoarseness.
5. Wheezing.
6. Coughing up blood or frothy sputum.
7. Carbonaceous materials around mouth and nose.
8. Orthopnea.
9. Suspect if facial burns or singed facial hair, symptoms may not be evident until hours after the injury.

C. LABORATORY TESTS

1. NONE.

D. LABORATORY FINDINGS

1. NONE.

E. COMPLICATIONS

1. Pulmonary edema.
2. Respiratory arrest.

F. TREATMENT

1. Give humidified oxygen at 4-6 liters/minute.
2. Give D5W IV to provide hydration.
3. Bronchodilators may be beneficial:

    a. Albuterol aerosol inhaler.
    b. IV Aminophylline.
    c. Oral Theophylline.

4. Expectorants
5. Analgesics
6. Stop smoking
7. Provide chest physical therapy to promote clearance of particulate matter from lungs and bronchi.
8. Give steroids as directed by Medical Officer.
9. Give hydrochlorothiazide if pulmonary edema is suspected.

G. DISPOSITION

1. MEDEVAC ASAP.

SPONTANEOUS PNEUMOTHORAX

A. GENERAL CONSIDERATIONS

Before proceeding with a discussion of the diagnosis and treatment of a spontaneous pneumothorax, let's briefly review the concept of a pneumothorax. This term refers to gas that is collected in the pleural space. The result is either a partial or complete collapse of the lung on the affected side. Normally, the pressure in the pleural space is below the atmospheric pressure. The lung is therefore held in an expanded position. When air leaks into this space, the pressure moves toward atmospheric, collapsing the lung. If there is a "one-way-valve" leak, the result is a tension pneumothorax. This is a true medical emergency.

As the pressure rises toward atmospheric, the lung begins to collapse. In a large pneumothorax, the trachea and mediastinal structures shift away from the affected side. In a tension pneumothorax or in a very large spontaneous pneumothorax this shift completely collapses the affected lung, compromises the good lung, and impedes cardiac return. This situation is not compatible with life. Immediate measures must be undertaken to save the life of the patient.

A spontaneous pneumothorax is a rupture in a small "bleb" in the visceral pleura. This is a common disorder in young healthy adults. It can occur at rest or with exertion. They have a strong tendency to reoccur (some put the estimate at 50%). This disorder may result from an underlying pulmonary disease (asthma, emphysema, etc.) and in such conditions a chest tube is usually needed to treat it.

Most of the time the leak is self-sealing and can be managed conservatively. KEEP IN MIND THAT A SPONTANEOUS PNEUMOTHORAX MAY NOT SEAL AND MAY PROGRESS TO A TENSION PNEUMOTHORAX.

B. ESSENTIALS OF DIAGNOSIS

1. Sudden onset of pleuritic chest pain and dyspnea are the most common complaints.
2. Tachypnea
3. Decreased chest excursion on the affected side.
4. Mediastinal shift and tracheal deviation away from the affected side (with a large pneumothorax).
5. Sometimes air will get under the skin of the chest and neck (subcutaneous emphysema) and produce a crinkly crepitus to palpation.

C. LABORATORY TESTS

1. None.

D. LABORATORY FINDINGS

1. None.

F. TREATMENT

1. Strict bed rest with patient lying on the affected side.
2. Give oxygen therapy at 6-8 liters/minute by nasal catheter.
3. Relieve pain with codeine 15-60 mg every 3-4 hours.
4. IF TENSION PNEUMOTHORAX OCCURS TREAT AS PER PMG ON THIS TOPIC.
5. For patients with simple pneumothorax in severe respiratory distress, treat as a tension pneumothorax.

G. DISPOSITION

1. Consult with a Medical Officer for further treatment and/or prepare for MEDEVAC ASAP.
2. DO NOT MEDEVAC THE PATIENT IN AN UNPRESSURIZED AIRCRAFT. THIS WILL INCREASE THE PNEUMOTHORAX. IF IT IS NECESSARY TO FLY IN SUCH AN AIRCRAFT, STAY UNDER 1000 FEET.